Speed Racer

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Description

There is a speed racer who must rescue their friend at the top of Mount Domo, which is m km away, as quickly as possible. For a given speed v in km/hr, the amount of fuel t consumed in L/hr is:

$$a * v^4 + b * v^3 + c * v^2 + d * v = t$$

What is the maximum speed, speed racer can drive to reach the top of Mount Domo without running out of gas?

Solution

From the equation, $a * v^4 + b * v^3 + c * v^2 + d * v = t$, solving for v will yield the maximum speed possible given t fuel, which is the solution if $t <= m$. m is the factor which will determine maximum speed. If we take the equation and factor in m, following correct unit conventions we should arrive at our answer.

$$L/hr = L/km * km/hr$$

We simply solve:

$$a * v^4 + b * v^3 + c * v^2 + d * v = t/m * v$$

$$a * v^3 + b * v^2 + c * v + d = t/m$$

$$a * v^3 + b * v^2 + c * v = t/m - d$$

Let

$$n = t/m - d$$

So,

$$a * v^3 + b * v^2 + c * v = n$$

for v.

Input

An input file containing a problem per line. Each line containing 6 single-space separated positive floating point values: a b c d m t No input value will exceed 1000. There will always be a solution. Truncate, rather than round, the final result.

Output

A single floating point value representing the maximum speed, speed racer can travel to reach the top of Mount Domo without running out of fuel, formatted as a decimal with exactly two digits right of the decimal point and no leading zeros.